What is Claimed Is:

1. A patterned grid polarizer for use in lithography, comprising:
   (a) a substrate that is transparent to ultraviolet (UV) light; and
   (b) an array of elements patterned on the substrate, wherein the elements polarize UV light.

2. The polarizer of claim 1, wherein the elements are patterned to produce tangentially polarized outgoing light from unpolarized incoming light, wherein the incoming light is incident upon the polarizer and outgoing light exits the polarizer.

3. The polarizer of claim 1, wherein the elements are patterned to produce radially polarized outgoing light from unpolarized incoming light, wherein the incoming light is incident upon the polarizer and outgoing light exits the polarizer.

4. The polarizer of claim 1, wherein the elements are patterned in a plurality of groups, wherein the groups are arranged in a circular pattern and each group is comprised of parallel elements, wherein the elements of one group are not parallel to the elements of a second group.

5. The polarizer of claim 1, wherein the elements are circular.

6. The polarizer of claim 5, wherein the elements are patterned in concentric circles.

7. The polarizer of claim 1, wherein the elements have a pitch of between about one tenth of a wavelength of the UV light and twice the wavelength of the UV light.

8. The polarizer of claim 1, wherein the elements have a pitch of about one quarter of a wavelength of the UV light.

9. The polarizer of claim 1, wherein the elements have a period of between about 45 nm and 95 nm.

10. The polarizer of claim 1, wherein the elements have a thickness of between approximately 0.04 and 0.3 μm.

11. The polarizer of claim 1, wherein the elements include aluminum, silver or gold.

12. The polarizer of claim 1, further comprising a source of UV light.

13. The polarizer of claim 12, wherein the UV light is unpolarized.

14. The polarizer of claim 12, wherein the UV light comprises at least two polarizations and wherein the wire grid polarizer reflects most of the light of a first polarization and transmits most of the light of a second polarization.

15. The polarizer of claim 12, wherein the wire grid polarizer converts the UV light into tangentially polarized light.

16. The polarizer of claim 12, wherein the wire grid polarizer converts the UV light into radially polarized light.

17. The polarizer of claim 1, wherein the substrate is fused silica, calcium fluoride, sapphire, quartz or magnesium fluoride.

18. An apparatus for polarizing UV light comprising:

(a) a source producing a light beam having at least one wavelength within the UV spectrum;

(b) a substrate transparent to light in the UV spectrum and disposed in a path of the light beam; and

(c) an array of elements on the substrate;

wherein the array of elements polarize incident UV light and output a polarized outgoing light.

19. The apparatus of claim 18, wherein the elements have a period of about one quarter the wavelength of the beam of UV light.

20. The apparatus of claim 18, wherein the elements have a period between about 0.1λ and 0.5λ, where λ is the wavelength of the beam.

21. The apparatus of claim 18, wherein the elements have a thickness of between about 0.04 and 0.3 μm.

22. The apparatus of claim 18, wherein the substrate includes fused silica, calcium fluoride, or sapphire.

23. The apparatus of claim 18, wherein the elements generally reflect most incident light of a first polarization direction and transmit most of the light of a second polarization direction.

24. The apparatus of claim 18, wherein the elements are radially configured to produce tangentially polarized outgoing light.

25. The apparatus of claim 18, wherein the elements are concentrically configured to produce radially polarized light.

26. An apparatus for providing an exposure beam along an optical path comprising:

(a) a wire grid polarizer; and

(b) an illuminator having a pupil;

wherein the polarizer comprises a substrate that is transparent to ultraviolet (UV) light and an array of elements patterned on the substrate that polarize UV light and produce a pattern of polarization in the UV light at the pupil of the illuminator.

27. An apparatus for providing an exposure beam along an optical path comprising:

(a) a wire grid polarizer; and

(b) projection optics;

wherein the polarizer comprises a substrate that is transparent to ultraviolet (UV) light and an array of elements patterned on the substrate that polarize UV light and produce a pattern of polarization in the UV light output toward the projection optics.